# Effectiveness Of Blended Learning And E-Learning Modes Of Instruction On The Performance Of Undergraduates In Kwara State, Nigeria

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## ABSTRACT

This study investigated the effectiveness of blended learning and E-learning modes of instruction on the performance of undergraduates in Kwara State, Nigeria. It also determined if the student performance would vary with gender. Quasi experimental that employs pretest, posttest, control group design was adopted for this study. This involves three groups, two experimental (blended learning, and E-learning) and a control group (traditional teaching method). Educational Materials and Methods Performance Test (EMPT) was used for data collection from 30 students that formed the sample for the study. The reliability coefficient of 0.71 was obtained from Kuder-Richardson (KR-20) formula. The Analysis of Covariance (ANCOVA) and Scheffe post hoc test were used to test the hypotheses. Findings of this study showed that: (i) there was significant difference in the performance of the three groups in favour of Experimental group 1 (Blended learning), (ii) there was no significant difference in the performance of male and female undergraduates taught with blended learning, (iii) similarly, no significant difference was found in the performance of male and female undergraduates exposed to e-learning mode of instruction. This implies that performance of undergraduates was enhanced when they are exposed to blended learning mode of instruction. Based on the findings, it was recommended that university lecturers should be encouraged to adopt blended learning for teach their students. Also, government and appropriate university authorities should support and encourage the usage of blended learning in Nigerian universities.

**Keywords:** *Effectiveness, Undergraduate, Blended Learning, E-learning, Gender*

## INTRODUCTION

In Nigeria, traditional method of teaching where lecturer stands before the students and delivered his lecture while students listen, take notes and remained passive throughout the teaching and learning process. This method is a teacher-centred approach. Teacher dominates the class and students accept what the teacher says without questioning or contributing to the lecture. In a classroom situation, students differed in terms of intellectual ideas and perception; they learn and understand more quickly and easily than others but these facts were not take into consideration in traditional method of teaching (Umoh, & Akpan, 2014). Traditional method of teaching alone may not be suitable for individual requirements thus, there is need for modern technology to cater for difference learning styles. These could include: mobile learning, flipped classroom, e-learning, blended learning, among others.

E-learning can be defined as the use of electronic technology to deliver education and training applications, monitor learners' performance and report their progress (Salawudeen, 2010). It is an innovative approach for delivering electronically mediated, well-designed, learner-centered and interactive learning environment to anyone, anytime by utilizing the internet and digital technologies in relation to instructional design principles (Ayandu, Eludiora, Amassoma & Ashiru, 2011). From general perspective, e-learning is a network technology-based mode of instruction that uses computer and other ICTs, to deliver instruction and provide access to information resources (Organization for Economics Corporation and Development [OECD], 2005). Therefore, the use of e-learning technologies gives lecturers the diversity of their lectures, displaying more information and enhancing students learning. Dawley (2007) opined that e-learning encouraged learners to seek information, evaluate it, share it collaboratively and, ultimately, transform it into their own knowledge. E-learning helps learners to take responsibility of their learning, becomes autonomous and self-confident. It enables introvert students to interact more freely, provides diversification of activities, fosters their intrinsic motivation and permits the acquisition of valuable study and time management skills.

Empirical evidences on effectiveness of e-learning has not been concluded. For instance, Banditvilai (2016) reported that online practice is directly beneficial to enhance the four language learning skills as well as autonomous learning and learner's motivation. Mooneyhan (2012) compare the traditional teaching method of Concepts Fitness (CF) Teaching Method using the Internet as an instructional supplement and found no significant difference between the two groups on the pre-test and posttest scores. In another study, Kolowich (2009) opined that blended learning can produce better teaching and learning outcomes than E-learning or face-to-face mode of instructions.

The concept of blended learning has been around for a long time, but its terminology was not firmly established until around the beginning of the 21st century. Blended learning can be defined as learning systems that combine face-to-face instruction with computer mediated instruction (Graham, 2013). It involves a combination of conventional face-to-face and online technology-based learning (Wang, 2011). The combination may involves mixing various event-based activities such as face-to-face classroom, live e-learning, self-paced learning, synchronous online conference and training, or asynchronous self-pace learning (Graham, 2013).

In this study, blended learning involves combining Internet and face-face physical co-presence of teacher and students. It motivates students to learn on their own at their own pace and in their own time (Poon, 2013). If properly implemented, it is a promising alternative learning approach compared to conventional and e-learning approach, and can improved student success, satisfaction, and retention (University of Central Florida, 2015). In addition, Graham (2013) argued that the blended learning will replace the traditional approach in education because it maximized the best advantages of face-to-face and e-learning approaches. In spite of these benefits of blended learning, Umoh and Akpan (2014) reported that non-availability, non-accessibility and inadequate students' ICT skills towards the utilization of blended learning tools for teaching and learning is a barrier to its adoption in Nigerian universities.

Empirical studies on blended learning remained controversial among researchers. Some studies revealed that it enhanced students' performance while others claimed otherwise. For instance, Al-Qahtani and Higgins (2013) investigated the effect of e-learning, blended learning and traditional teaching method on students' achievement and found a significant difference among the three groups in favour of the blended learning method. Furthermore, no significant difference was found between the e-learning and traditional teaching method. In another study, Giannousi, Vernadakis, Derri, Antoniou, and Kioumourtzoglou (2014) investigate the impact of traditional method of teaching and blended instruction on the performance of students' taught Physical Education course. Results revealed that blended learning group was more successful than students' in traditional method group. Similarly, Giovengo (2014) reported a significant difference between the traditional and blended groups on training transfer of content validity and transfer design. A study by Sisco, Woodcock, and Eady (2015) revealed that students were generally favoured by online e-teaching synchronous platform over those in face-to-face presentations, and the quality of online presentations was considered as good as face-to-face presentations. Also, Hiralaal (2012) reported that the students got immediate feedback from online assessments, and there was greater lecturer-student interaction as well as student-student interaction through meaningful dialogue with peers. Finally, there was more convenience, flexibility and access to learning in the blended learning environment. Contrarily, Chang, Shu, Liang, Tseng, and Hsu (2014) examined the effects of blended e-learning on electrical machinery

performance and found no significant difference in achievement test scores between blended e-learning and traditional method of teaching. Also, Elmer, Carter, Armga, and Carter (2016) found no significant difference between blended and traditional laboratories. In another study, Ferriman (2013) investigate the impact of a blended e-learning environment on academic writing assignments in English (L2) at a Thai international college and study revealed that the experimental group had higher means on six of the nine outcomes, though there were no statistically significant. The question is, can blended learning mode of instruction enhance students' performance in Nigeria irrespective of gender?

Gender refers to those characteristics of males or females which are biologically determined (Okeke, 2008). Influence of gender on students' academic performance has not been concluded. For instance, Bertea, (2009) opined that e-learning embraces the active participation of male and female students. Similarly, Lee, Yeh, Kung and Hsu (2007) investigate the factors affecting the learning in a blended e-Learning course for Mathematics, the result revealed no significant difference between male and female students in the aspects of examination scores, learning attitudes, and learning portfolios. In another study by Askar, Altun, and Ilgaz (2008) and Adas and Abu Samais, (2011) established a significant difference between female and male students exposed to blended learning. Contrarily, Koohang, (2004) reported that male students perform better than their female counterparts when taught using Blended learning strategy. Similarly, Mahmoud, Ahmed and Mirna (2012) reported a significant difference between male and female students who experienced Blended learning courses.

Based on the above literature, the present study was to investigate the effectiveness of blended learning and e-learning on the performance of undergraduates in Kwara State, Nigeria.

**Research Questions**

The following research questions were raised to guide this study:

(i) What is the difference in the performance of undergraduates exposed to blended learning, E-learning and traditional teaching method?

(ii) What is the difference between the performance of male and female undergraduates taught with blended learning?

(iii) What is the difference between the performance of male and female undergraduates exposed to e-learning?

**Research Hypotheses**

The following null hypotheses were formulated and tested at 0.05 level of significance:

$Ho_1$: There is no significant difference in the performance of undergraduates exposed to blended learning, e-learning, and traditional teaching method.

$Ho_2$: There is no significance difference between the performance of male and female undergraduates taught with blended learning.

$Ho_3$: There is no significance difference between the performance of male and female undergraduates exposed to e-learning.

## METHODOLOGY

**Research Design**

The study adopted quasi-experimental using pre-test, post-test, control group design. This involves two levels of experimental (blended learning, and e-learning), and one control group (traditional teaching method). The independent variables in this study are teaching methods. These are: (i) Blended Learning (ii) E-learning, and (iii) Traditional Teaching Method. The dependent variable is the post-test performance of the students in the three groups. The moderating variable is gender of students in the study. The design layout is as shown in Table 1.

**Table 1: Research Design Layout**

| Groups | Pre-test | Treatment | Posttest |
|---|---|---|---|
| Experimental Group 1 | $O_1$ | Blended Learning | $O_2$ |
| Experimental Group 2 | $O_3$ | E-learning | $O_4$ |
| Control Group | $O_5$ | Traditional Teaching Method | $O_6$ |

Pretest was administered on the experimental and control groups before the treatment. After five-week of treatment, posttest was administered on the groups. Experimental group I was exposed to blended learning, experimental group II was taught using e-learning, while control group was taught using traditional teaching method.

**Sample and Sampling Technique**

The population for this study comprised of all the university students in Nigeria. The target population is the undergraduates from three universities in Kwara State, Nigeria. Selection of the universities was purposeful and based on the following criteria: (i) they have undergraduates offering education courses; (ii) they offer the chosen educational technology concept at 200 level.

Sample for pilot study was drawn from Educational Technology students from a University in Niger State, Nigeria that has similar characteristics with the selected universities. They also offer concept treated in this study (Educational Materials and Method (EDT 203), in the year 2014/2015 academic session. The choice of 200 level students was based on the following criteria: (i) the students owned a computer system (laptop, tablet, iPad, etc) to download information, (ii) they have been exposed to some pre-requisite of computer skills, (iii) the concept treated in this study is part of 200 level General Education course designed for students in Faculty of Education in Nigeria University (NUC, 2011).

Undergraduates from each university were assigned into Experimental group I (Blended Learning), Experimental Group I (E-learning), and Control group (Traditional Teaching Method). Intact classes were used in each of the three Universities. The distribution of sample along the variables is shown in Table 2.

**Table 2: Distribution of sample for the study**

| Sample | Gender | | Total |
|---|---|---|---|
| | Male | Female | |
| Experimental Group I | 15 | 15 | 30 |
| Experimental Group II | 15 | 15 | 30 |
| Control Group | 17 | 8 | 25 |
| Total | 47 | 38 | 85 |

Table 2 shows the distribution of sample for the study. From the Table, 85 undergraduates participated in the study. Thirty (30) were exposed to blended learning mode (Experimental group I), 30 were also exposed to the E-learning mode (Experimental group II), while 25 of were exposed to traditional teaching method (Control group).

**Research Instruments**

The research instruments employed for this study include: (i) The Treatment Instrument – Course Material, (ii) Test Instrument – Educational Materials and Methods Performance Test (EMPT).

**(i) The Treatment Instrument- Course Material:** The course material consists of five topics which was sub-divided into 15 units of lesson. The topics were extracted from Education Materials and Method course (EDT 203) which is a core course for all 200 level students offering Education courses. The course contents

were prepared by the researchers using recognized textbooks, materials from the Internet and contributions from course lecturers. The topics covered Basic concept of Audio; Visual; Audio-visual; Principle of Media Production, and Criteria for Effective Design.

**(ii) Test Instrument – Educational Materials and Method Performance Test (EMPT):** This instrument consists of two sections. Section A dealt with students Bio-data such as: Name of institution, Department, Level, and Gender. Section B focused on the questions for eliciting responses from students. This section consists of thirty multiple-choice objective questions. Each item in the instrument have four options (A-D) of possible answer to the question. EMPT was administered to the experimental and control groups as pre-test and post-test respectively. To reduce the test retest effects, the questions were reshuffled and administered in a different random order as post-test. On the scoring of the multiple-choice items, '1' mark was awarded for each correct answer and '0' for each wrong answer.

**Validation of Research Instruments**

**(i) The Treatment Instrument– Course Material:** The course material was validated by five educational technology lecturers from four selected universities in Nigeria. Similarly, field trial validation of the treatment was carried out on 30 students from a university which is part of the population but used for real experiment. Suggestions and comments from the experts and students were used in producing the final copy of the course material.

**(ii) Test Instrument– Educational Materials and Method Performance Test (EMPT):** The test instrument was validated by five (5) Educational Technology experts from another university in Nigeria. The experts assessed the face and content validity of the test instrument in relation to the background of undergraduates' programme in Educational Technology. The experts also examined all the items in instrument with reference to the: appropriateness of the contents, extent to which the content covered the topics they were designed to cover. Finally, comments, opinions and suggestions of the experts were effected appropriately.

To test the reliability of the test instrument, EMPT was administered on 30 selected undergraduates from another university which is part of the population. Reliability coefficient of 0.71 was obtained using Kuder-Richardson (KR-20).

**Procedure for Data Collection**

The experimental group I (Blended learning) received face-to-face learning interaction and online learning using two class hours per week in face-to-face mode and one class hour in the computer classroom per week. During one class hour in the computer classroom, students logged into the website created for the study to access the learning materials. Undergraduates in this group was supported by review and repeated practices using the website in asynchronous mode.

The experimental group II (e-learning) received online learning using three class hours per week in the computer classroom. While in the computer classroom, students logged into the website using Moodle Courseware Platform for accessing the learning materials. This group of explored the features of Moodle platform such as: Discussion Forums, Content managing (resources), Quizzes with different kinds of course related questions, Blogs, Wikis, Database activities, Surveys, Chat, Glossaries, Peer assessment, Video and Audio supports, Announcement and many others. However, there was no face-to-face interaction with the lecturers.

The control group (traditional teaching method) received face-to-face lectures, paper-based handouts, and teaching materials, using three class hours per week. The lecture materials contained: Objectives of the lesson, Introduction, Main Contents, Self-Assessment Exercises, Tutor-Marked Assignment, Summary, Conclusion, and References/Further Readings.

At the beginning of the experiment, pretest was administered to the three groups while posttest was administered after five weeks of treatment to measure their performance. Data obtained from the pretest and posttest were subjected to data analysis.

## RESULTS

Analysis of Covariance (ANCOVA) and Sidak post-hoc analyses were used to test hypotheses based 1 to 3. All the hypotheses were tested at 0.05 level of significance.

**$Ho_1$:** There is no significant difference in the performance of undergraduates exposed to blended learning, e-learning, and traditional teaching method.

To determine whether there was no significant difference between the performance of undergraduate taught using, E-learning, blended learning and conventional teaching method, ANCOVA and Sidak post-hoc test was carried out as shown in Table 3, 4 and 5.

**Table 3: ANCOVA result of the performance scores of students taught using blended learning, e-learning and conventional teaching method**

| Source | Type III Sum of Squares | df | Mean Square | F | P-value |
|---|---|---|---|---|---|
| Corrected Model | 365.239 | 3 | 121.746 | 40.240 | 0.000 |
| Intercept | 505.585 | 1 | 505.585 | 167.107 | 0.000 |
| Main effect (treatment) | 51.485 | 2 | 25.742 | 8.508* | 0.000 |
| Pretest | 131.440 | 1 | 131.440 | 43.444 | 0.000 |
| Error | 245.067 | 81 | 3.026 | | |
| Total | 25585.000 | 85 | | | |
| Corrected Total | 610.306 | 84 | | | |

* : Significant at 0.05 Alpha level

As illustrated in Table 3, there was a significant main effect of learning strategy on students' performance, $F(1, 81) = 10.641$, $p < 0.05$. The results revealed that there was significant difference in the performance of blended learning group, E-learning group and control group taught educational materials and methods. Hence, hypothesis one was rejected. In order to establish the direction of difference among the three groups, Sidak post-hoc analysis was conducted. This is shown in Table 4.

**Table 4: Summary of Sidak analysis of significant difference on mean performance scores of undergraduates in the three groups**

| Variable (i) | Variable (j) | Mean Difference (i-j) | P-value |
|---|---|---|---|
| Blended | E-learning | 1.1333 | 0.129 |
| | Traditional | 4.0533 | 0.000* |
| E-learning | Blended | -1.1333 | 0.129 |
| | Traditional | 2.9200 | 0.000* |
| Traditional | Blended | -4.0533 | 0.000* |
| | E-learning | -2.9200 | 0.000* |

*: Significant at 0.05 alpha level

Table 4 revealed that, there was no significant difference between students taught using Blended Learning and E-Learning (P > 0.05). Furthermore, there was significant difference between Undergraduates' taught using Blended Learning and Conventional Teaching Method (P < 0.05). Similarly, there is significant difference between Undergraduates' taught using E-learning and those exposed to Conventional Teaching Method.

**Table 5: Mean performance scores of undergraduates taught using, e-learning, blended learning and conventional teaching method**

| Groups | N | Pretest Mean | Posttest Mean | Mean Gain Score |
|---|---|---|---|---|
| Blended Learning | 30 | 12.77 | 18.73 | 5.96 |
| E-Learning | 30 | 11.67 | 17.60 | 5.93 |
| Conventional Teaching Method | 25 | 9.12 | 14.68 | 5.56 |

Table 5 shows that there was improvement in the post-test scores of the three groups but the Blended learning) had a higher mean gain score than the other groups. From the Table, the Blended learning group had a mean gain score of 5.96, followed by E-learning group with a mean gain score of 5.93, and Traditional Teaching Method Group with a mean gain score of 5.56. This was further illustrated in Figure 1.

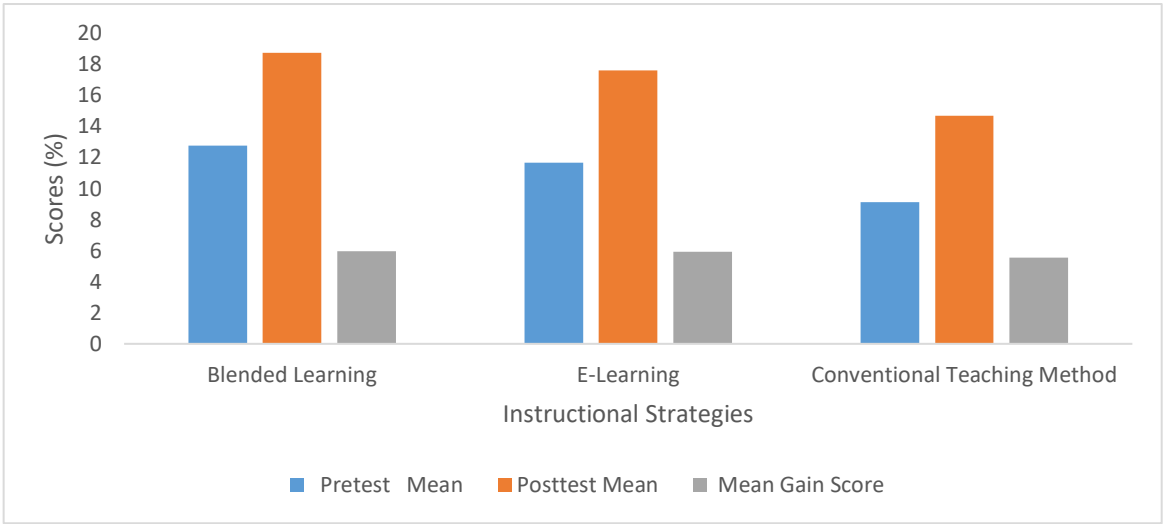


**Figure 1: Graphical illusration of performance mean gain scores of blended learning, e-learning and traditional teaching method**

**$Ho_2$:** There is no significance difference between the performance of male and female undergraduates taught with blended learning.

To determine whether there was no significance difference between the performance of male and female undergraduates taught using blended learning. ANCOVA statistics was conducted as shown in Table 6.

**Table 6: ANCOVA result of the male and female undergraduates taught using blended learning**

| Source | Type III Sum of Squares | df | Mean Square | F | P-value |
|---|---|---|---|---|---|
| Corrected Model | 85.565[a] | 2 | 42.782 | 14.035 | 0.000 |
| Intercept | 129.256 | 1 | 129.256 | 42.404 | 0.000 |
| Main effect (gender) | 5.757 | 1 | 5.757 | 1.889[ns] | 0.181 |
| Pretest | 55.565 | 1 | 55.565 | 18.229 | 0.000 |
| Error | 82.302 | 27 | 3.048 | | |
| Total | 10696.000 | 30 | | | |
| Corrected Total | 167.867 | 29 | | | |

ns : not significant at 0.05 Alpha level

Table 6 revealed no significant main effect of learning strategy on male and female undergraduates' performance, F (1, 27) = 1.889, p > 0.05. This indicates that there was no statistical significant difference in the performance of male and female undergraduates taught educational materials and method using blended learning. Hence, hypothesis two was not rejected. This implies that male and female students performed equally better when exposed to Blended learning strategy.

**$Ho_3$:** There is no significance difference between the performance of male and female undergraduates exposed to e-learning.

To determine whether there was no significance difference between the performance of male and female undergraduates taught educational materials and method using E-learning, Analysis of Covariance using the pretest as a covariate was done as shown in Table 7.

**Table 7: ANCOVA results of the male and female undergraduates exposed to e-learning mode**

| Source | Type III Sum of Squares | df | Mean Square | F | P-value |
|---|---|---|---|---|---|
| Corrected Model | 16.106 | 2 | 8.053 | 2.194 | 0.131 |
| Intercept | 252.018 | 1 | 252.018 | 68.667 | 0.000 |
| Main effect (gender) | 1.955 | 1 | 1.955 | 0.533[ns] | 0.472 |
| Pretest | 11.306 | 1 | 11.306 | 3.081 | 0.091 |
| Error | 99.094 | 27 | 3.670 | | |
| Total | 9408.000 | 30 | | | |
| Corrected Total | 115.200 | 29 | | | |

ns : not significant at 0.05 Alpha level

As illustrated in Table 7, there was no significant main effect of instructional strategy on male and female Undergraduates' performance, F (1, 27) = 0.533, p > 0.05. The results indicated that there was no significant difference in the performance of male and female undergraduates taught educational materials and method using e-learning. Hence, hypothesis three was not rejected. This implies that male and female undergraduates' performed equally better when exposed to E-learning strategy.

## DiSCUSSION

The study revealed that undergraduates exposed to blended learning mode of instruction performed better than those in traditional teaching method. This finding is in agreement with that of Al-Qahtani and Higgins (2013) which reported significant difference among the blended learning, e-learning and traditional teaching method in favour of the blended learning mode. It also agrees with that of Giannousi, Vernadakis, Derri, Antoniou, and Kioumourtzoglou (2014), Giovengo (2014) and Sisco, Woodcock, and Eady (2015) which revealed that blended learning group was more successful than traditional teaching method on students´ achievement. However, the finding of this study contradicts that of Chang, Shu, Liang, Tseng, and Hsu (2014) and Elmer, Carter, Armga, and Carter (2016) which reported no significant difference in achievement of students exposed to blended learning mode, traditional teaching method and traditional laboratory respectively. It also disagrees with that of Ferriman (2013) which revealed that blended learning had higher means on six of the nine outcomes, though, these were not statistically significant.

The outstanding performance of students exposed to blended learning over those taught using E-learning and traditional teaching method confirmed the fact that using blended learning was a better approach for teaching undergraduates in Nigeria. The superiority of blended learning over e-learning and traditional teaching method stem from the fact that blended learning combined the potentials of e-learning and traditional teaching methods together.

The influence of blended learning and e-learning instructional modes on male and female undergraduates revealed that gender had no influence on the performance of undergraduates. This implies that the treatment improved the performance of the undergraduates exposed to blended learning and E-learning irrespective of gender. This finding is in agreement with the that of Adas and Abu Samais, (2011), Askar, Altun, and Ilgaz (2008), and Lee, Yeh, Kung and Hsu (2007) which reported no significant difference between female and male students' performance in blended learning. However, this finding disagree with that of Mahmoud, Ahmed and Mirna (2012) which revealed significant difference in students' performance between male and female students who experienced Blended learning courses. It also contradicts the finding of Koohang (2004) who reported that male students perform better than their female counterparts when taught using Blended learning.

## CONCLUSIONS

This study explored the effectiveness of blended learning and E-learning instructional modes on undergraduates' performance in universities in Kwara State, Nigeria. The blended learning mode of instruction was found effective for learning educational technology concept. The undergraduates taught using blended learning mode of instruction performed better than their counterparts taught using e-learning and traditional teaching method. However, no significance difference between male and female undergraduates exposed to blended learning and e-learning was also found. This implies that blended learning and e-learning modes of instructions can bridge the gap between gender disparity in academic performance.

## RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made:

(i) The teaching process in Nigeria universities should not rely on the traditional pattern of lecturing in relation to teaching educational courses. Instead, other methods of teaching such as Blended learning mode need to be introduced, where the presence of an instructor is supported by the use of modern technology, which renders the learning process more flexible in terms of time and place.

(ii) Lecturers teaching educational technology courses should expose the students to various modes of blended supported learning management system to promote student-centered instructional approach, students 'autonomy to knowledge acquisition, and student-self-discovery learning

(iii) ICT trainings should be conducted for lecturers from time-to-time to update and get acquainted with latest technological innovations like blended learning. This will enable them to develop, modify and maintain latest online learning technologies like, blended learning and E-learning within the university system;

(iv) Government and appropriate universities 'authorities should embrace and support the use of blended learning and E-learning platform in institutions as this could enhance students 'performance their programmes;

(v) Students should endeavour to explore the opportunities offered by blended learning and E-learning. Since blended learning could be utilized to complement other method of teaching and learning as well as for individual learning.

## REFERENCES

Adas, D. & Abu Shmais, W. (2011). Students' perceptions towards blended learning environment using the OCC. *An-Najah University Journal for Research Humanities, 25*(6), 1681-1710.

Al-Qahtani, A. A. Y., & Higgins, S. E. (2013). Effects of traditional, blended and e-learning on students' achievement in higher education. *Journal of Computer Assisted Learning*, 29(3), 220-234.

Askar, P. Altun, A., & Ilgaz, H. (2008). *Learner satisfaction on blended learning*. E-Leader conference, Krakow, Poland.

Ayanda, D., Eludiora, S., Amassoma, D., & Ashiru, M. (2011). Towards a model of e-learning in Nigeria higher institutions: An evolutionary software modelling approach. *Information and Knowledge Management,*1(1), 31-39. Retrieved May 9, 2014, from http://www.iiste.org

Ayodele, A. (2010). *Taking advantage of on-line learning.* Punch Newspaper, 1st Dec, 2007.

Bertea, P. (2009). *Measuring students‟ attitude towards E-learning:* A Case Study. Proceedings of 5th International Scientific Conference on eLearning and Software for Education, Bucharest, April 9th-10th.

Banditvilai, C. (2016). Enhancing students' language skills through blended learning. *Electronic Journal of e-Learning*, 14(3), 220-229.

Chang, Shu, Liang, Tseng, &Hsu (2014). Is blended e-learning better than traditional Classroom learning for vocational high school students? 15(2), 142-146.

Dawley, L. (2007). *The tools for successful online teaching*. London: Information Science Publishing.

Friesen, N. (2014). *Report: Defining blended,* [online], Available:http://learningspaces.org/papers/Defining_Blended_Learning_ NF.pdf.

Glazer, F. S. (2012). *Blended learning: Across the discipline, across the academy.* Stylus Publishing.

Giovengo, R. D. (2014). *Training transfer, metacognition skills, and performance*

*outcomes in blended versus traditional training programs.* ProQuest LLC, Ph.D. Dissertation, Walden University. DAI-B 75/07(E), Dissertation abstracts international. available at http://search.proquest.com/docview/1511968829

Graham, C. R. (2006). Blended learning systems: Definition, current trends, and future directions. *The Handbook of Blended Learning Global Perspectives, Local Designs*. (Ed: Bonk, C.J. & Graham, C.R.). Pfeiffer.San Francisco

Elmer, S. J., Carter, K. R., Armga, A. J. & Carter, J. R. (2016). Blended learning within an undergraduate exercise physiology laboratory. *Advances in Physiology Education*, 40(1), 64-69.

Ferriman, N. (2013). The Impact of blended e-learning on undergraduate academic essay Writing in English (L2). *Computers & Education*, 60(1), 243-253.

Giannousi, M., Vernadakis, N., Derri, V., Antoniou, P. & Kioumourtzoglou, E. (2014). A comparison of student knowledge between traditional and blended instruction in a physical education in early childhood course. *Turkish Online Journal of Distance Education*, 15(1), 99-113.

Graham, C. R. (2013). *Emerging practice and research in blended learning.* Handbook of distance education 3.

Hiralaal, A. (2012). Students' experiences of blended learning in accounting education at the Durban University of Technology. *South African Journal of Higher Education*, 26(2), 316-328.

Kolowich, S. (2009). *Sustainable hybrid: Blended learning, preliminary data indicate hybrid courses produce better outcomes.*

Koohang, A. (2004). Students' perceptions toward the use of the digital library in weekly web-based distance learning assignments portion of a hybrid programme. *British Journal of Educational Technology, 35,* 617–626.

Lee, C., Yeh, D., Kung, R., & Hsu, C. (2007). The influences of learning portfolios and attitudes on learning effects in blended e-learning for Mathematics. *Journal of Educational Computing Research,* 37(4), 331-350.

Mahmoud, A. N., Ahmed, A. & Mirna, N. (2012). Evaluating student satisfaction with blended learning in a gender-segregated. *Environment Journal of Information Technology Education: Research*, (11), 193.

Mooneyhan, A. (2012). Using the internet as a supplemental delivery method on University concepts of fitness Classes. *International Journal on E-Learning*, 11(2), 181-187.

NUC (National University Commission, 2011). *Accredited programmes for Nigerian universities.* Abuja: NUC.

Okeke, E. A. C. (2008). Clarification and Analysis of gender concepts. Focus on research, reproductive health education, and gender sensitive classrooms. *Science Teachers Association of Nigeria, Gender and STM Education Series,* 2, 5-8.

Organization for Economic Corporation and Development. (2005). E-learning in tertiary education: Where do we stand. Retrieved from http://www.oecdbookshop.org/display.asp on 12/04/2013

Poon, J. (2013). Blended learning: An institutional approach for enhancing students' learning experiences. *Journal of Online Learning and Teaching*, 9(2) Available http://jolt.merlot.org/vol9no2/poon_0613.htm

Reich, J. (2015). Rebooting MOOC research. *Science*, 347(6217), 34-35.

Salawudeen, O. S. (2010). *E-learning technology. The Nigerian experience.* Abuja: Roger Printing and Publishing Limited, Abuja

Sisco, A., Woodcock, S., & Eady, M. (2015). Pre-service perspectives on e-teaching: Assessing e-teaching using the EPEC hierarchy of conditions for e-learning/teaching competence. *Canadian Journal of Learning and Technology*, (41), 3.

The University of Central Florida. (2015). benefits of blended learning, Available at http://blended.online.ucf.edu/about/benefits-of -blended-learning/

Umoh, J. B., & Akpan, E. T. (2014). Challenges of blended e-learning tools in mathematics: Students' perspectives University of Uyo. *Journal of Education and Learning*, 3(4), 60-70.

Wang, S. (2011). Benefit and challenges of e-learning: University students' perspectives. Retrieved July 3, 2013 from http://www.igi-global.com/chapter/benefits-challenges-learning/53285?camid=

Yam, S. & Rossini, P. (2011), Online learning and blended learning: which is more effective? *17th Pacific Rim Real Estate Society Conference, 16-19 January 2011 - Gold Coast, Australia.*